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The Mineral Industry of the Federal Republic of Germany

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The Mineral Industry of the Federal Republic of Germany

By George A. Rabchevsky[1]

The economic performance of mineral production in the Federal Republic of Germany (FRG) was uncharacteristically erratic during 1984, although the economy was in the third year of its upswing. Some mineral industries were adversely affected by overcapacity and labor unrest with layoffs and shorter workweeks being considered. Unemployment, almost 9%, was becoming a serious problem, climbing to over 2.2 million workers, the highest since the currency reform of 1948. Despite a damaging metalworkers strike, the gross national product expanded by 2.6% in 1984, the highest rate of growth since 1979. As a consequence of the strike settlement, the average workweek in the metal processing industries was reduced from 40 hours to 38.5 hours effective April 1985. IG Metall, the 2.5 million-member metalworkers' union, claimed that this would save as many as 70,000 to 80,000 jobs in the metal industry.[2]

In a generally positive economic picture, some soft spots in major industries and regions stood out. As in most European Economic Community (EEC) countries, traditional "smokestack" industries were in trouble, particularly coal mining, coke production, petroleum refining, shipbuilding, and steel. These industries were centered in the Hamburg, Bremen, and Ruhr areas of North Rhine-Westphalia, the Saarland, and Schleswig Holstein. These areas had in the past enjoyed generally higher average incomes than in the FRG's southern Laender. A major reduction of capacity in the competitive steel industry had been under way since the mid-1970's. Other industries, such as petroleum refining, were also in a period of major downsizing. Petroleum refining capacity had peaked in 1978, and current capacity utilization rate was only 76%.

In the fall of 1984, the West German Government was considering selling many of its plants in mineral and metal-related businesses to private industry; the Government held talks with a number of concerned companies and prospective buyers, including major banks. Most metals and minerals plants in the FRG had been traditionally private. The Government-owned industrial holding company Vereinigte Industrieunternehmungen AG, which had interests in aluminum, electricity, and gas, was one of the prime contenders for full or partial privatization. The Government also considered selling shares of the steel company, Salzgitter AG, and the coal mining concern, Saarbergwerke AG, because of their poor economic performances.

PRODUCTION

Despite the temporary interruption by a strike in the metals processing industry, industrial minerals and metals production rose by 3.3%. Reportedly, the 1984 profits of most minerals producing and processing companies were up, some by 2.5% or more, an increase last achieved in 1979.

Except for a small gain in silver output, all nonferrous metal mines in the FRG registered a decline in production. The companies were seeking ways to either restructure or diversify, to ensure continued employment of their workers. However, most nonferrous metals industries, except

copper, performed well. Most producers of nonmetals increased their output, although minor fluctuations occurred in certain industrial minerals production. Overall, mineral fuels production declined, except fuel briquets and peat.

Table 1.—Federal Republic of Germany: Production of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1980	1981	1982	1983[p]	1984[e]
METALS					
Aluminum:					
Bauxite, gross weight	264	79	494	359	300
Alumina thousand tons	1,608	1,651	1,510	1,580	1,701
Metal:					
Primary do.	731	729	723	743	777
Secondary:					
Alloyed do.	368	360	364	387	401
Unalloyed do.	40	41	45	41	41
Cadmium metal, smelter	1,194	1,192	1,030	1,094	1,111
Cobalt metal, smelter[e]	300	[r]150	150	100	100
Copper:					
Mine output, metal content	1,274	1,429	1,303	1,209	1,046
Metal:					
Smelter:					
Primary	153,900	163,100	161,800	159,100	158,000
Secondary	103,900	88,300	78,200	94,500	87,000
Total	257,800	251,400	240,000	253,600	245,000
Refined including secondary:					
Electrolytic	302,516	304,068	313,664	332,397	297,773
Fire-refined	71,483	83,370	80,408	87,928	81,143
Total	373,999	387,438	394,072	420,325	378,916
Gold:					
Mine output, metal content troy ounces	2,964	3,051	1,813	[e]1,900	1,500
Metal including secondary do.	298,873	298,873	[e]299,000	[e]300,000	310,000
Iron and steel:					
Iron ore and concentrate:					
Gross weight thousand tons	[r]1,945	[r]1,572	1,319	976	977
Iron content do.	[r]596	[r]476	386	279	293
Metal:					
Pig iron do.	33,873	31,876	27,621	26,598	30,203
Blast furnace ferromanganese, spiegeleisen, ferrosilicon do.	264	264	242	174	309
Ferroalloys, electric-furnace do.	182	154	131	119	156
Steel, crude do.	43,838	41,610	35,880	35,729	39,389
Semimanufactures do.	31,661	30,850	25,782	26,061	27,957
Lead:					
Mine output, metal content	23,063	21,605	23,455	23,523	20,998
Metal:					
Smelter:					
Primary	111,891	107,493	110,749	116,216	102,289
Secondary	189,458	254,824	239,746	236,259	254,944
Total	301,349	362,317	350,495	352,475	357,233
Refined:					
Primary	191,100	189,500	201,600	212,500	216,200
Secondary	159,200	158,800	148,900	135,500	141,000
Total	350,300	348,300	350,500	348,000	357,200
Mercury (secondary only) 76-pound flasks	1,624	2,205	1,537	2,005	
Nickel metal including secondary[e]	[3]1,235	1,200	1,200	1,200	1,000
Platinum[e] troy ounces	2,411	2,411	2,420	2,450	2,000
Silver:					
Mine output, metal content thousand troy ounces	1,058	1,126	1,279	1,167	1,225
Metal including secondary do.	24,371	21,126	[e]21,000	[r e]20,000	21,500
Tin metal including secondary	2,262	1,815	608	417	400
Zinc:					
Mine output:					
Metal content	120,800	110,700	105,800	113,900	92,500
Metal content, recoverable	99,720	91,779	86,920	92,562	92,467
Metal, unwrought, unalloyed:					
Primary	342,797	331,471	303,373	328,689	325,567
Secondary	27,849	35,085	31,578	27,848	30,824
Total	370,646	366,556	334,951	356,537	356,391

See footnotes at end of table.

Table 1.—Federal Republic of Germany: Production of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1980	1981	1982	1983[p]	1984[e]
NONMETALS					
Abrasives: Artificial: Corundum	102,222	97,026	80,385	74,201	88,962
Barite	175,380	165,189	165,661	163,965	166,568
Bromine	4,006	3,567	3,073	3,136	3,306
Cement and clinker:					
Cement (excluding clinker) thousand tons	34,186	31,498	30,078	30,466	28,909
Clinker do	1,360	1,364	959	702	742
Clays:					
Fire clay excluding klebsand do	5,791	5,478	5,594	5,792	5,800
Kaolin, marketable do	502	475	454	407	410
Bleaching do	638	625	700	601	650
Other (schieferton) do	152	131	86	75	100
Diatomite and similar earth, marketable	52,824	42,373	42,695	44,195	44,500
Feldspar, marketable	380,880	342,148	331,430	330,000	260,000
Fluorspar, marketable:					
Acid-grade[e]	70,337	64,627	[r]70,779	[r]72,607	73,000
Metallurgical-grade[e]	7,815	7,181	[r]7,860	[r]8,100	8,100
Total	78,152	71,808	78,639	80,707	81,100
Graphite:					
Crude	11,375	16,372	23,305	[e]23,500	24,000
Marketable[e]	5,688	8,186	11,653	10,000	12,000
Gypsum and anhydrite, marketable thousand tons	2,250	1,952	1,721	1,720	2,200
Lime (hydrated), quicklime, dead-burned dolomite do	8,576	7,916	6,898	6,871	6,941
Nitrogen: N content of ammonia do	2,044	1,962	1,570	1,703	1,963
Phosphates: Thomas slag-based fertilizer, P_2O_5 content do	161	138	130	93	62
Pigments, mineral, natural	24,669	22,524	18,589	19,886	20,000
Potash, K_2O equivalent:					
Crude, marketable thousand tons	76	72	75	87	92
Chemically processed do	2,661	2,519	1,981	2,332	2,552
Total do	2,737	2,591	2,056	2,419	2,644
Pumice:					
Crude and washed do	2,102	1,253	745	645	1,013
Marketable do	807	399	220	200	355
Pyrites, marketable concentrate, gross weight do	502	483	508	554	500
Quartz, quartzite, glass sand:					
Quartzite do	454	395	326	331	362
Quartz sand, ground do	453	422	378	337	316
Quartz sand, unground and glass sand do	7,475	7,018	7,320	7,391	7,195
Salt, marketable:					
Rock do	6,759	8,367	7,034	6,265	7,000
Marine and other do	4,637	4,174	3,944	4,137	4,200
Sodium compounds:					
Sodium carbonate do	1,411	1,189	1,105	1,218	1,364
Sodium sulfate do	225	255	214	125	128
Stone, sand and gravel, n.e.s.:					
Dimension stone[e] thousand cubic meters	264	324	254	237	300
Limestone, industrial thousand tons	53,477	49,243	42,935	44,371	43,505
Crushed and broken stone do	117,616	99,149	93,286	91,445	97,439
Slate do	50	52	53	62	23
Basalt lava and lava sand do	8,153	7,784	7,010	6,350	7,482
Calcite do	5	3	3	4	3
Grinding stone[e] cubic meters	[3]43	42	40	40	42
Sand and gravel thousand tons	188,155	164,437	150,016	146,414	143,278

See footnotes at end of table.

Table 1.—Federal Republic of Germany: Production of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1980	1981	1982	1983[p]	1984[e]
NONMETALS —Continued					
Sulfur:					
S content of pyrites thousand tons	222	213	229	(3)	--
Byproduct:					
Of metallurgy[e] do	450	400	400	400	350
Of natural gas do	814	834	872	632	860
Of petroleum[e] do	[3]220	190	220	195	190
Unspecified[e] do	[3]93	95	100	95	90
Total do	1,799	1,732	1,821	1,322	1,490
Talc including talc schist do	15	15	15	14	14
MINERAL FUELS AND RELATED MATERIALS					
Carbon: Carbon black	353,568	354,191	348,037	362,125	382,420
Coal:					
Anthracite and bituminous thousand tons	87,146	88,460	89,014	82,202	79,426
Lignite do	129,833	130,619	127,307	124,281	126,739
Total do	216,979	219,079	216,321	206,483	206,165
Coke, metallurgical do	28,494	27,914	26,275	22,427	20,586
Fuel briquets:					
Of anthracite and bituminous coal do	1,455	1,332	1,285	1,244	1,437
Of lignite do	4,446	4,169	3,951	3,568	3,818
Gas:					
Manufactured (excluding that from petroleum refineries):[6]					
Blast furnace million cubic feet	199,456	185,752	153,545	147,683	174,345
Coke oven do	226,336	227,246	214,144	185,858	174,345
Natural, gross do	658,430	673,014	568,909	622,339	563,258
Peat:					
Agricultural use thousand tons	1,555	1,742	1,842	1,868	1,429
Fuel use do	279	246	253	259	277
Petroleum:					
Crude thousand 42-gallon barrels	33,450	32,207	30,734	29,730	29,289
Refinery products:					
Gasoline, motor do	182,296	167,731	171,599	170,885	170,801
Jet fuel (including aviation gasoline) do	10,506	11,802	11,099	11,231	13,318
Kerosine do	315	349	388	356	295
Distillate fuel oil do	311,192	270,977	264,823	252,029	260,018
Residual fuel oil do	128,509	143,037	127,852	104,649	92,701
Lubricants do	9,922	9,874	9,229	8,687	11,205
Liquefied petroleum gas do	30,938	26,425	26,262	23,942	23,548
Bitumen do	20,406	18,470	17,676	19,460	18,514
Unspecified do	122,646	47,304	38,205	45,809	42,665
Refinery fuel and losses do	57,827	55,762	52,255	50,169	48,769
Total do	874,557	751,731	719,388	687,217	681,834

[e]Estimated [p]Preliminary. [r]Revised.

[1]Table includes data available through June 1985.

[2]Primary nickel and nickel contained in ferronickel, Monel metal, and nickel oxide directly used by the steel industry.

[3]Reported figure.

[4]Partial figures.

[5]Revised to zero.

[6]Other types of manufactured gas may be produced but production data are not reported, and available information is inadequate to make reliable estimates. Estimates presented in previous editions of this Yearbook are considered unreliable.

TRADE

The FRG was actively negotiating trade with the U.S.S.R. Mannesmann AG, for example, was reportedly holding talks on the sale of surface mining and coal processing equipment to develop Siberian lignite reserves. The project would be the largest East-West Siberian transaction since the agreement to build the trans-Siberian gas pipeline. Ruhrgas AG signed an agreement with the U.S.S.R. to supply West Berlin with natural gas from the trans-Siberian export pipeline. Deliveries were scheduled to begin in 1985 and were to increase over a period of several years to 650 to 700 million cubic meters per year. FRG's Thyssen Rheinstahl Technik GmbH received an or-

der for a steel-rolling mill for the Krivoy Rog Works in the Ukraine. Mannesmann Demag signed a contract to construct two steel pipe plants in the U.S.S.R., one in Baku on the Caspian Sea and the other in Taganrog on the Sea of Azov.

Since the signing of an economic cooperation agreement in 1979 with China, the FRG had established technical working groups on agriculture, coal, and nonferrous metals. Since that time, over 40 representative offices have been set up in Beijing, Shanghai, and Guangzhou by West German industries. The FRG was China's largest trading partner in Western Europe in 1983, trade having increased sevenfold over that of 1972. One major current cooperation project under negotiation was the construction by the FRG of the Shanghai Bao steelworks.

Table 2.—Federal Republic of Germany: Exports of selected mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
METALS				
Alkaline-earth metals	16	27	3	Italy 14.
Aluminum:				
Ore and concentrate	33,742	43,934	1,662	Belgium-Luxembourg 20,378; France 4,262.
Oxides and hydroxides	438,067	467,939	11,849	Canada 108,377; East Germany 73,894.
Ash and residue containing aluminum	10,210	10,055	NA	France 4,952; Netherlands 3,237.
Metal including alloys:				
Scrap	67,719	77,722	14	Italy 24,108; Netherlands 20,659.
Unwrought	267,403	321,146	11,758	Italy 80,562; France 59,140; Netherlands 40,762.
Semimanufactures	434,174	506,659	18,788	France 86,811; United Kingdom 74,134; Italy 45,021.
Antimony:				
Oxides	422	571	93	Switzerland 107; Spain 57.
Metal including alloys, all forms	9	17	NA	NA.
Arsenic: Oxides and acids	827	471	NA	United Kingdom 304; Italy 125.
Bismuth: Metal including alloys, all forms	251	82	17	United Kingdom 35.
Cadmium: Metal including alloys, all forms	617	633	NA	NA.
Cesium and rubidium: Metal including alloys, all forms value, thousands	$21	$47	NA	NA.
Chromium:				
Ore and concentrate	12,959	8,694	--	Netherlands 4,205; Denmark 2,082.
Oxides and hydroxides	11,622	12,643	NA	NA.
Metal including alloys, all forms	101	106	1	Belgium-Luxembourg 31; Netherlands 30.
Cobalt:				
Oxides and hydroxides	25	86	--	Netherlands 33; Italy 18.
Metal including alloys, all forms	816	885	6	Italy 72; undetermined 664.
Columbium and tantalum:				
Ore and concentrate	1,424	1,328	859	Netherlands 452.
Metal including alloys, all forms:				
Columbium (niobium)	45	97	NA	NA.
Tantalum	75	86	3	NA.
Copper:				
Ore and concentrate	2	2,662	--	All to Sweden.
Matte and speiss including cement copper	41	2,569	--	Netherlands 2,132.
Oxides and hydroxides	2,562	2,546	112	Denmark 560; United Kingdom 402.
Sulfate	1,680	2,212	NA	NA.
Ash and residue containing copper	15,513	18,986	NA	Austria 8,297; Belgium-Luxembourg 3,410.
Metal including alloys:				
Scrap	61,514	67,128	726	Italy 22,623; Belgium-Luxembourg 13,296.
Unwrought	104,114	122,905	474	United Kingdom 32,418; East Germany 23,169.
Semimanufactures	391,080	413,782	45,289	France 53,564; Netherlands 40,752; Italy 38,927.
Gallium: Metal including alloys, all forms	6	14	2	Japan 5; Netherlands 4.
Germanium: Metal including alloys, all forms value, thousands	$388	$879	$105	United Kingdom $690.

See footnotes at end of table.

Table 2.—Federal Republic of Germany: Exports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
METALS —Continued				
Gold:				
Ash and residue containing gold value, thousands	$222	$672	NA	Belgium-Luxembourg $372; Netherlands $270.
Waste and sweepings do	$1,545	$2,977	$1,293	Switzerland $756; Netherlands $436.
Metal including alloys, unwrought and partly wrought thousand troy ounces	2,111	1,211	15	United Kingdom 274; Belgium-Luxembourg 242.
Hafnium: Metal including alloys, all forms value, thousands	$5	$11	--	NA.
Iron and steel:				
Iron ore and concentrate:				
Excluding roasted pyrite	5,763	9,944	37	Belgium-Luxembourg 6,165; East Germany 1,508.
Pyrite, roasted	51,264	38,932	--	Belgium-Luxembourg 13,427; France 11,084.
Metal:				
Scrap thousand tons	3,048	3,172	(2)	Italy 1,673; Belgium-Luxembourg 423.
Pig iron, cast iron, related materials do	825	541	1	France 322; Italy 49; Spain 35.
Ferroalloys:				
Ferrochromium	53,988	55,901	5,966	France 16,605; India 7,592.
Ferromanganese	32,975	48,198	9,445	Italy 6,113; Belgium-Luxembourg 5,512.
Ferromolybdenum	1,010	1,025	NA	Netherlands 314; Poland 174.
Ferronickel	50	274	NA	Netherlands 112; France 99.
Ferrosilicochromium	2,920	3,179	NA	Belgium-Luxembourg 1,798; France 591.
Ferrosilicomanganese	5,729	5,134	NA	Switzerland 3,270; Belgium-Luxembourg 1,274.
Ferrosilicon	59,191	59,052	588	Italy 13,124; Belgium-Luxembourg 8,609.
Silicon metal	5,036	6,378	449	Netherlands 2,289; France 1,013.
Unspecified	9,257	11,754	1,513	Japan 1,489; Austria 1,032.
Steel, primary forms thousand tons	3,185	2,985	417	Belgium-Luxembourg 428; France 396; United Kingdom 389.
Semimanufactures:				
Bars, rods, angles, shapes, sections do	2,722	2,866	144	France 540; East Germany 402; Netherlands 361.
Universals, plates, sheets do	5,817	5,719	608	U.S.S.R. 771; France 504; East Germany 350.
Hoop and strip do	1,264	1,253	42	France 158; U.S.S.R. 146; Netherlands 125.
Rails and accessories do	235	219	30	Italy 81; Netherlands 33.
Wire do	310	305	23	Netherlands 53; France 52; Belgium-Luxembourg 38.
Tubes, pipes, fittings do	4,111	3,628	140	U.S.S.R. 1,404; China 374; Netherlands 262.
Castings and forgings, rough do	115	118	5	France 18; Belgium-Luxembourg 15.
Lead:				
Ore and concentrate	55	741	--	All to Belgium-Luxembourg.
Oxides	11,728	13,238	186	Netherlands 3,503; U.S.S.R. 2,001.
Ash and residue containing lead	14,774	18,190	2	Belgium-Luxembourg 12,568.
Metal including alloys:				
Scrap	13,588	17,194	--	Italy 6,600; Netherlands 6,569.
Unwrought	100,622	120,330	1,589	Italy 32,378; France 15,252; Egypt 12,826.
Semimanufactures	14,176	16,905	137	Denmark 3,591; Saudi Arabia 2,018.
Lithium:				
Oxides and hydroxides	510	610	NA	France 198; Belgium-Luxembourg 126.
Metal including alloys, all forms	40	60	NA	Switzerland 46; Japan 6.
Magnesium: Metal including alloys:				
Scrap	1,686	1,563	202	Italy 822; Netherlands 150.
Unwrought	323	92	--	Belgium-Luxembourg 34; France 17.
Semimanufactures	934	883	10	India 199; Netherlands 144.

See footnotes at end of table.

Table 2.—Federal Republic of Germany: Exports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
METALS —Continued				
Manganese:				
Ore and concentrate, metallurgical-grade	1,497	4,020	101	United Kingdom 2,989.
Oxides	716	476	NA	France 131; Italy 101.
Metal including alloys, all forms	98	143	NA	Spain 40; United Kingdom 4.
Mercury 76-pound flasks	8,077	16,675	464	Netherlands 5,974; East Germany 5,597.
Molybdenum:				
Ore and concentrate	7,442	6,898	149	Netherlands 3,120; Belgium-Luxembourg 1,681.
Metal including alloys:				
Unwrought and scrap	391	591	NA	NA.
Semimanufactures	39	30	NA	Japan 9; Brazil 5.
Nickel:				
Matte and speiss	136	5,553	--	Netherlands 1,803; Canada 1,318.
Oxides and hydroxides	135	2,437	1,764	Sweden 235; Netherlands 183.
Ash and residue containing nickel	1,582	1,583	NA	Austria 922; Netherlands 305.
Metal including alloys:				
Scrap	7,700	7,637	316	Sweden 6,492; Netherlands 454.
Unwrought	9,461	14,358	336	Netherlands 7,558; France 3,175.
Semimanufactures	9,575	8,766	2,398	United Kingdom 930; France 924.
Platinum-group metals:				
Ash and residue containing platinum value, thousands	$3	$5	NA	NA.
Waste and sweepings do.	$1,347	$1,185	NA	Spain $774; Netherlands $335.
Metals including alloys, unwrought and partly wrought:				
Palladium troy ounces	143,437	115,223	38,643	Switzerland 16,291; Netherlands 12,859.
Platinum do.	238,142	225,203	12,334	Switzerland 66,982; France 33,950.
Unspecified do.	90,732	102,236	17,848	Japan 14,779; Austria 7,894; Switzerland 7,691.
Rare-earth metals including alloys, all forms	253	170	NA	NA.
Rhenium: Metal including alloys, all forms value, thousands	$24	$19	NA	NA.
Selenium, elemental and phosphorus	8,414	9,651	NA	NA.
Silver:				
Ash and residue containing silver value, thousands	$1,732	$2,904	NA	United Kingdom $1,500; Belgium-Luxembourg $836.
Waste and sweepings do.	$1,266	$3,515	NA	Spain $1,532; United Kingdom $964.
Metal including alloys, unwrought and partly wrought thousand troy ounces	43,886	47,814	209	United Kingdom 10,413; East Germany 9,137.
Tellurium, elemental and arsenic	9	14	2	Belgium-Luxembourg 2; Canada 2; Sweden 2.
Tin:				
Oxides	72	61	--	All to East Germany.
Ash and residue containing tin	3,025	3,652	34	United Kingdom 3,401.
Metal including alloys:				
Scrap	133	230	--	Netherlands 134; Denmark 77.
Unwrought	4,025	4,356	1,831	Netherlands 1,328; United Kingdom 517.
Semimanufactures	857	1,114	101	Austria 198; undetermined 309.
Titanium:				
Ore and concentrate	5,377	6,652	--	Bulgaria 2,600; France 866.
Oxides	56,028	58,956	12,903	Italy 5,820; Netherlands 2,820.
Metal including alloys:				
Scrap	1,043	1,169	125	United Kingdom 774; Spain 90.
Unwrought	106	100	NA	United Kingdom 45; Austria 20.
Semimanufactures	622	1,029	NA	France 329; Spain 187; Netherlands 135.
Tungsten:				
Ore and concentrate	--	76	--	Albania 41; Spain 20.
Ash and residue containing tungsten	126	312	NA	Austria 289.
Metal including alloys:				
Scrap	304	470	--	NA.
Unwrought	335	298	--	NA.
Semimanufactures	72	92	5	Romania 15; Sweden 9; Brazil 8.

See footnotes at end of table.

Table 2.—Federal Republic of Germany: Exports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
METALS —Continued				
Uranium and thorium:				
Ore and concentrate				
value, thousands	(2)	$10	--	Czechoslovakia $9.
Oxides and other compounds	326	647	NA	France 509.
Metal including alloys, all forms	7	4	--	Italy 3; United Kingdom 1.
Vanadium:				
Ash and residue containing vanadium	889	1,486	NA	Belgium-Luxembourg 1,031.
Metal including alloys:				
Scrap value, thousands	$4	--	--	
Unwrought	135	192	--	United Kingdom 150; France 40.
Semimanufactures				
value, thousands	$9	$7	--	NA.
Zinc:				
Ore and concentrate	144,537	158,868	--	East Germany 61,492; Belgium-Luxembourg 36,961; Netherlands 34,286.
Oxides	19,202	19,379	NA	NA.
Blue powder	4,151	5,755	68	Hungary 1,101; Netherlands 915.
Matte	7,470	9,826	NA	Belgium-Luxembourg 4,727; Italy 2,614.
Ash and residue containing zinc	98,173	85,405	4,200	Sweden 30,622; France 13,694.
Metal including alloys:				
Scrap	8,623	14,889	--	Belgium-Luxembourg 4,683; Netherlands 4,256.
Unwrought	113,602	133,180	22,788	Italy 34,924; Netherlands 13,670.
Semimanufactures	18,620	21,192	36	NA.
Zirconium:				
Ore and concentrate	16,379	14,461	--	Netherlands 2,179; Czechoslovakia 2,145; Yugoslavia 1,819.
Metal including alloys:				
Scrap	38	40	15	France 23.
Unwrought	37	25	2	France 6; United Kingdom 5.
Semimanufactures	26	21	1	Canada 19.
Other:				
Ores and concentrates	--	18	--	East Germany 12.
Oxides and hydroxides	11,057	11,885	NA	NA.
Ashes and residues	76,210	59,274	878	Belgium-Luxembourg 34,823; Netherlands 11,940.
Base metals including alloys, all forms	25,066	26,020	5	East Germany 25,877; United Kingdom 72.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	266,971	269,338	33	Netherlands 249,444.
Artificial:				
Corundum	45,755	45,760	2,667	Italy 4,903; Austria 4,557.
Silicon carbide	22,971	26,164	NA	NA.
Dust and powder of precious and semiprecious stones including diamond kilograms	743	1,389	148	Greece 372; Austria 215; Italy 211.
Grinding and polishing wheels and stones	13,632	14,202	652	France 1,728; Iran 1,478; Netherlands 1,020.
Asbestos, crude	47,239	34,261	NA	NA.
Barite and witherite	39,886	37,839	162	France 11,969; Belgium-Luxembourg 5,613.
Boron materials:				
Crude natural borates	15,717	13,743	--	East Germany 9,472; Sweden 3,607.
Elemental	5	15	1	France 3.
Oxides and acids	976	665	--	Yugoslavia 365; Switzerland 73.
Bromine	11	13	NA	NA.
Cement thousand tons	2,673	2,312	--	Netherlands 1,538; Iraq 126; Libya 109.
Chalk	48,053	54,979	81	Netherlands 16,975; Sweden 13,561; Finland 13,496.

See footnotes at end of table.

Table 2.—Federal Republic of Germany: Exports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
NONMETALS —Continued				
Clays, crude:				
Bentonite	21,122	31,488	NA	Belgium-Luxembourg 12,210; France 8,224.
Ceramic	825,625	839,641	NA	Italy 399,214; Netherlands 167,556; France 126,696.
Chamotte earth	37,277	29,950	NA	Netherlands 13,086; France 4,177.
Fire clay	360,038	355,235	NA	Italy 139,949; Belgium-Luxembourg 79,229; Netherlands 72,472.
Fuller's earth	3,865	6,361	NA	Netherlands 2,067; France 2,064.
Kaolin	91,488	96,395	NA	Italy 26,395; Netherlands 14,408.
Unspecified	266,417	219,085	NA	Netherlands 149,907; Italy 21,447.
Cryolite and chiolite	5	40	1	Italy 31.
Diamond:				
Gem, not set or strung carats	134,503	120,733	8,527	Belgium-Luxembourg 55,598; Switzerland 21,643.
Industrial stones do.	249,798	321,615	53,306	Belgium-Luxembourg 79,481; Ireland 52,600.
Diatomite and other infusorial earth	2,344	2,660	12	Netherlands 611; East Germany 559.
Feldspar, fluorspar, related materials:				
Feldspar	15,176	17,465	NA	France 8,602; Belgium-Luxembourg 2,673.
Fluorspar	13,219	12,921	NA	Netherlands 4,684; Austria 3,281.
Unspecified	1,128	1,235	NA	Belgium-Luxembourg 1,098.
Fertilizer materials:				
Crude, n.e.s	58,589	74,683	--	Netherlands 63,837.
Manufactured:				
Ammonia thousand tons	223	176		Denmark 131; France 12.
Nitrogenous do.	959	1,252	10	Belgium-Luxembourg 361; Netherlands 172; Austria 91.
Phosphatic do.	45	70		East Germany 33; Austria 15.
Potassic do.	1,997	2,193	50	Belgium-Luxembourg 668; India 212; Japan 148.
Unspecified and mixed do.	957	1,106	(2)	Belgium-Luxembourg 342; France 152; Austria 140.
Graphite, natural	10,029	9,978	763	East Germany 1,544; Italy 698.
Gypsum and plaster	327,411	309,826	27	Netherlands 146,592; Belgium-Luxembourg 56,438.
Iodine	45	50	NA	Mexico 19; Italy 6.
Kyanite and related materials	8,790	5,556	--	Italy 1,347; France 1,343; Austria 1,283.
Lime	381,361	397,465	19	Netherlands 255,755; France 65,829.
Magnesium compounds:				
Magnesite	8,917	9,842	NA	France 7,159; Sweden 815.
Oxides and hydroxides	7,849	7,265	257	Italy 1,467; Netherlands 657.
Other	8,196	9,216	NA	Netherlands 3,103; Italy 1,989.
Mica:				
Crude including splittings and waste	879	919	--	Netherlands 335; Spain 153.
Worked including agglomerated splittings	274	220	(2)	Italy 63; United Kingdom 44.
Phosphates, crude	1,602	1,925	--	Switzerland 1,563.
Pigments, mineral:				
Natural, crude	1,094	1,659	714	Switzerland 499.
Iron oxides and hydroxides, processed	135,935	144,553	9,549	France 21,969; United Kingdom 16,746.
Potassium salts, crude	38,562	38,253	--	United Kingdom 18,276; Belgium-Luxembourg 16,653.
Precious and semiprecious stones other than diamond:				
Natural kilograms	273,194	325,875	14,854	Japan 99,547; China 78,609; Hong Kong 31,489.
Synthetic do.	26,883	22,760	2,039	Japan 12,108; Switzerland 3,210.
Pyrite, unroasted	2,031	1,041	NA	NA.
Quartz crystal, piezoelectric kilograms	96	71	NA	Iran 52.
Salt and brine thousand tons	1,942	1,793	(3)	Belgium-Luxembourg 1,231; Sweden 224.
Sodium compounds, n.e.s.:				
Carbonate, manufactured	160,188	281,745	20	Belgium-Luxembourg 98,095; China 30,000.
Sulfate, manufactured	87,719	53,706	NA	Italy 13,260; Belgium-Luxembourg 7,756.

See footnotes at end of table.

Table 2.—Federal Republic of Germany: Exports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Destinations, 1983	
			United States	Other (principal)
NONMETALS —Continued				
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked thousand tons	1,373	1,119	(2)	Netherlands 997; Switzerland 70.
Worked do	31	50	(2)	East Germany 14; Austria 8.
Dolomite, chiefly refractory-grade do	215	211	(2)	Netherlands 11; France 57.
Gravel and crushed rock do	9,756	9,907	(2)	Netherlands 7,779; Switzerland 1,126.
Limestone other than dimension do	44	37	--	Netherlands 22; Belgium-Luxembourg 12.
Quartz and quartzite do	132	124	(2)	Belgium-Luxembourg 52; Netherlands 33.
Sand other than metal-bearing do	6,437	7,352	(2)	Netherlands 5,783; Belgium-Luxembourg 1,153.
Sulfur:				
Elemental:				
Crude including native and byproduct	602,558	461,821	1	Netherlands 195,192; Denmark 61,513.
Colloidal, precipitated, sublimed	280	314	70	Netherlands 84; Belgium-Luxembourg 28.
Dioxide	24,427	18,033	NA	Netherlands 5,356; Austria 5,277.
Sulfuric acid	766,913	648,629	7,665	Netherlands 223,141; Belgium-Luxembourg 159,088.
Talc, steatite, soapstone, pyrophyllite	4,159	4,663	--	Yugoslavia 1,315; East Germany 580.
Vermiculite, perlite, chlorite	4,686	4,841	--	Belgium-Luxembourg 2,770; Netherlands 1,041.
Other:				
Crude thousand tons	2,381	3,090	25	Netherlands 1,989; Belgium-Luxembourg 495.
Slag and dross, not metal-bearing do	2,979	3,261	5	Netherlands 2,197; France 712.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	971	5,562	--	East Germany 4,158; Sweden 491.
Carbon:				
Carbon black	19,029	24,530	241	East Germany 18,918.
Gas carbon	109,799	110,906	529	France 23,073; Belgium-Luxembourg 13,845; Austria 13,316.
Coal:				
Anthracite and bituminous thousand tons	9,828	10,582	(2)	France 3,711; Belgium-Luxembourg 2,246; Italy 1,883.
Briquets of anthracite and bituminous coal do	349	409	--	United Kingdom 167; France 97.
Lignite including briquets do	741	661	--	Belgium-Luxembourg 203; Austria 143.
Coke and semicoke do	3,959	4,129	--	Belgium-Luxembourg 1,502; France 1,060.
Gas:				
Manufactured million cubic feet	39	72	--	All to Switzerland.
Gaseous do	392,176	336,530	NA	NA.
Peat including briquets and litter	542,127	528,189	57	Netherlands 328,007; Switzerland 57,093.
Petroleum:				
Crude thousand 42-gallon barrels	8,335	8,137	--	East Germany 8,094.
Refinery products:				
Liquefied petroleum gas do	6,710	8,309	8	Netherlands 3,646; Italy 1,430.
Gasoline do	15,863	13,762	80	Switzerland 4,462; France 2,975; Austria 2,235.
Mineral jelly and wax do	1,337	1,256	(2)	Netherlands 121; Belgium-Luxembourg 79.
Kerosine and jet fuel do	9,504	8,583	(2)	Switzerland 459; bunkers 7,531.
Distillate fuel oil do	7,485	7,263	1	France 1,529; Switzerland 1,100.
Lubricants do	3,258	3,214	10	Belgium-Luxembourg 498; United Kingdom 349.
Nonlubricating oils do	320	NA	--	--
Residual fuel oil do	24,543	23,393	166	United Kingdom 5,029; bunkers 5,670.
Bitumen and other residues do	2,136	2,262	--	Austria 599; Switzerland 486.
Bituminous mixtures do	131	111	(2)	Netherlands 32; Switzerland 24.
Petroleum coke do	1,566	1,864	--	Netherlands 573; France 400.

NA Not available.
[1]Table prepared by Jozef Plachy.
[2]Less than 1/2 unit.

Table 3.—Federal Republic of Germany: Imports of selected mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
METALS				
Alkali and alkaline-earth metals:				
Alkali metals	3	23	NA	France 20.
Alkaline-earth metals	236	270	2	France 165; Canada 48.
Aluminum:				
Ore and concentrate thousand tons	3,533	3,156	--	Australia 1,107; Guinea 863; Sierra Leone 579.
Oxides and hydroxides	492,196	488,477	2,308	Australia 201,696; Italy 134,852; Suriname 99,289.
Ash and residue containing aluminum	46,260	40,063	--	Austria 12,629; Netherlands 5,934.
Metal including alloys:				
Scrap	196,801	192,452	2,298	Netherlands 45,324; United Kingdom 32,843.
Unwrought	552,928	592,141	1,974	Norway 217,635; United Kingdom 53,358.
Semimanufactures	253,163	299,920	2,937	France 81,535; Netherlands 42,942; Belgium-Luxembourg 42,419.
Antimony:				
Ore and concentrate	1,640	1,706	--	Bolivia 921; China 700.
Oxides	3,899	5,167	100	France 1,614; United Kingdom 1,143.
Metal including alloys, all forms	440	371	NA	China 173; Belgium-Luxembourg 159.
Arsenic: Oxides and acids	501	369	NA	Belgium-Luxembourg 190; France 69.
Beryllium:				
Oxides and hydroxides value, thousands	$39	$44	--	All from United Kingdom.
Metal including alloys, all forms kilograms	354	338	208	NA.
Bismuth: Metal including alloys, all forms	332	418	NA	United Kingdom 119; Peru 117.
Cadmium:				
Oxides and hydroxides	487	635	NA	Belgium-Luxembourg 524.
Metal including alloys, all forms	784	829	NA	Belgium-Luxembourg 137.
Cesium and rubidium: Metal including alloys, all forms value, thousands	$10	$7	NA	NA.
Chromium:				
Ore and concentrate	244,279	247,187	--	Republic of South Africa 135,094; Albania 77,850.
Oxides and hydroxides	2,676	1,918	129	U.S.S.R. 621; China 430; Poland 378.
Metal including alloys, all forms	600	921	69	United Kingdom 314; Japan 196.
Cobalt:				
Ore and concentrate	(2)	5	--	NA.
Oxides and hydroxides	308	409	6	Belgium-Luxembourg 203; Canada 56.
Metal including alloys, all forms	1,450	2,009	78	Zaire 718; Belgium-Luxembourg 210.
Columbium and tantalum:				
Ore and concentrate	185	370	--	Canada 208; Sweden 110.
Ash and residue containing columbium and/or tantalum	1,383	866	--	Zimbabwe 210; Zaire 199.
Metal including alloys, all forms:				
Columbium (niobium)	24	41	34	France 5.
Tantalum	102	126	85	Belgium-Luxembourg 17.
Copper:				
Ore and concentrate	553,963	496,262	27,929	Papua New Guinea 205,039; Mexico 105,023; Poland 90,090.
Matte and speiss including cement copper	6,309	11,358	--	Poland 5,164; Australia 3,990.
Oxides and hydroxides	750	979	NA	Belgium-Luxembourg 606; Italy 350.
Sulfate	9,305	10,756	NA	Belgium-Luxembourg 2,362; Czechoslovakia 1,775.
Ash and residue containing copper	20,638	17,921	189	Italy 4,091; France 3,135; Netherlands 1,961.
Metal including alloys:				
Scrap	177,122	205,405	5,284	United Kingdom 44,984; France 42,916.
Unwrought	544,079	518,073	4,348	Chile 126,899; Poland 75,972; Republic of South Africa 66,941.
Semimanufactures	243,796	253,562	2,937	France 81,535; Netherlands 42,942; Belgium-Luxembourg 42,419.

See footnotes at end of table.

Table 3.—Federal Republic of Germany: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
METALS —Continued				
Gallium: Metal including alloys, all forms	7	14	2	Belgium-Luxembourg 4; Netherlands 2.
Germanium: Metal including alloys, all forms kilograms	1,800	3,700	NA	Belgium-Luxembourg 3,100.
Gold:				
Ash and residue containing gold value, thousands	$17,867	$26,394	$9,643	Canada $8,111; Bulgaria $6,561.
Waste and sweepings do.	$25,069	$22,660	$681	Sweden $5,703; Netherlands $3,167.
Metal including alloys, unwrought and partly wrought thousand troy ounces	3,879	1,965	42	Switzerland 405; U.S.S.R. 395.
Hafnium: Metal including alloys, all forms kilograms	700	500	450	NA.
Iron and steel:				
Iron ore and concentrate:				
Excluding roasted pyrite thousand tons	38,910	35,497	--	Brazil 13,220; Liberia 6,530; Australia 4,207.
Pyrite, roasted do.	430	88	--	Belgium-Luxembourg 40; Sweden 24.
Metal:				
Scrap do.	1,289	1,300	7	Netherlands 325; United Kingdom 218; Belgium-Luxembourg 207.
Pig iron, cast iron, related materials	269,217	227,815	189	Canada 57,827; Brazil 46,811.
Ferroalloys:				
Ferroaluminum	268	148	64	United Kingdom 65.
Ferrochromium	219,884	297,662	482	Republic of South Africa 178,457; Zimbabwe 48,237.
Ferromanganese	96,538	98,243	--	Norway 41,327; France 34,453.
Ferromolybdenum	4,207	4,583	85	Belgium-Luxembourg 2,758; United Kingdom 805.
Ferronickel	33,358	73,107	NA	Greece 23,733; New Caledonia 18,118.
Ferrosilicochromium	7,570	5,753	NA	Zimbabwe 4,363.
Ferrosilicomanganese	110,704	115,360	NA	Norway 58,697; Portugal 26,654.
Ferrosilicon	193,258	195,001	782	Norway 94,955; France 30,785.
Silicon metal	51,703	65,637	NA	Norway 25,128; France 12,649.
Unspecified	12,201	13,075	175	France 5,130; Belgium-Luxembourg 2,026.
Steel, primary forms thousand tons	1,501	1,904	(2)	Belgium-Luxembourg 531; Netherlands 299.
Semimanufactures:				
Bars, rods, angles, shapes, sections do.	3,663	4,517	1	Italy 981, Belgium-Luxembourg 925; France 434.
Universals, plates, sheets do.	3,539	3,834	2	Belgium-Luxembourg 982; France 647; Netherlands 352.
Hoop and strip do.	502	623	1	Belgium-Luxembourg 199; France 147; East Germany 71.
Rails and accessories do.	23	17	(2)	Netherlands 5; East Germany 3.
Wire do.	244	272	(2)	Belgium-Luxembourg 92; France 41; Austria 30.
Tubes, pipes, fittings do.	767	832	2	Italy 168; France 127; Netherlands 100.
Castings and forgings, rough do.	39	81	(2)	East Germany 44; France 5.
Lead:				
Ore and concentrate	192,371	217,753	1,081	Canada 56,443; Republic of South Africa 34,177; Sweden 29,463.
Oxides	8,329	9,924	57	Belgium-Luxembourg 3,551; Netherlands 2,013.
Ash and residue containing lead	19,244	16,091	4,193	France 3,5[illegible] United Kingdom 2,615.
Metal including alloys:				
Scrap	35,606	30,886	671	Neth[illegible]ds 12,100; Denmark 5,[illegible]
Unwrought	153,977	118,670	38	United Kingdom 30,094; Sweden 19,727.
Semimanufactures	3,151	3,803	6	Belgium-Luxembourg 2,530; France 724.
Lithium:				
Oxides and hydroxides	1,684	641	295	China 63; France 60.
Metal including alloys, all forms	14	13	1	United Kingdom 11.
Magnesium: Metal including alloys:				
Scrap	2,135	2,086	59	Italy 685; Netherlands 416.
Unwrought	26,886	28,274	6,138	Norway 12,085; Italy 4,856.
Semimanufactures	858	1,362	17	Austria 624; France 512.

See footnotes at end of table.

Table 3.—Federal Republic of Germany: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
METALS —Continued				
Manganese:				
Ore and concentrate, metallurgical-grade	393,546	434,261	--	Republic of South Africa 291,747; Australia 99,197.
Oxides	4,198	2,974	21	Belgium-Luxembourg 2,354.
Metal including alloys, all forms	5,989	5,468	504	Republic of South Africa 2,532; Belgium-Luxembourg 761.
Mercury 76-pound flasks	7,038	16,249	2,871	Netherlands 4,060; Spain 3,393.
Molybdenum:				
Ore and concentrate	21,524	19,061	3,935	Canada 3,208; Chile 2,757; Belgium-Luxembourg 2,237.
Oxides and hydroxides	265	274	24	Netherlands 191.
Metal including alloys:				
Scrap	381	433	12	Austria 305; France 29.
Unwrought	51	34	7	United Kingdom 14; France 7.
Semimanufactures	333	282	47	Austria 194; United Kingdom 20.
Nickel:				
Ore and concentrate	571	115	--	Albania 93.
Matte and speiss	13,847	11,999	--	Australia 4,580; Canada 2,737.
Oxides and hydroxides	193	186	NA	Canada 84; Netherlands 54.
Ash and residue containing nickel	2,244	2,037	48	Netherlands 405; Belgium-Luxembourg 378.
Metal including alloys:				
Scrap	6,419	4,902	410	France 1,309; Netherlands 927.
Unwrought	41,322	44,831	5,579	U.S.S.R. 12,300; Australia 6,514; Norway 6,081.
Semimanufactures	8,818	6,654	385	France 2,621; United Kingdom 1,091.
Platinum-group metals:				
Ash and residue containing platinum value, thousands	$4,588	$1,627	$699	United Kingdom $274; Bulgaria $248.
Waste and sweepings do	$31,174	$38,200	$6,943	Netherlands $5,478; Hungary $4,064.
Metals including alloys, unwrought and partly wrought:				
Palladium troy ounces	853,706	357,613	25,747	U.S.S.R. 166,632; United Kingdom 69,159.
Platinum do	777,382	491,913	85,148	Switzerland 131,080; United Kingdom 95,482.
Unspecified do	96,854	170,538	47,383	Republic of South Africa 87,620; United Kingdom 20,787.
Rare-earth metals including alloys, all forms	74	129	NA	NA.
Rhenium: Metal including alloys, all forms value, thousands	$320	$367	NA	Italy $225; U.S.S.R. $122.
Selenium, elemental and phosphorus	26,213	26,844	NA	NA.
Silicon, high-purity	92	54	(2)	Italy 29; United Kingdom 10.
Silver:				
Ash and residue containing silver value, thousands	$23,584	$34,794	$22,087	Switzerland $2,691; Canada $1,951.
Waste and sweepings do	$13,861	$19,469	$4,712	Netherlands $4,054; Sweden $1,582.
Metal including alloys, unwrought and partly wrought thousand troy ounces	40,847	35,679	5,360	Sweden 5,754; North Korea 2,347; Poland 2,137.
Tellurium, elemental and arsenic	77	74	NA	Sweden 25; Netherlands 19.
Tin:				
Ore and concentrate	1,766	2,166	--	Bolivia 1,461; Brazil 467.
Oxides	51	82	NA	United Kingdom 28; Italy 17.
Ash and residue containing tin	4,335	2,068	738	Netherlands 346; Belgium-Luxembourg 257.
Metal including alloys:				
Scrap	448	282	22	United Kingdom 85; Switzerland 50.
Unwrought	16,342	16,662	41	Malaysia 3,406; Indonesia 3,240.
Semimanufactures	1,233	156	1	United Kingdom 65; Netherlands 38.
Titanium:				
Ore and concentrate	409,412	403,732	1,009	Norway 256,729; Canada 86,267.
Oxides	20,824	23,487	2,897	Belgium-Luxembourg 9,492; France 5,289.
Metal including alloys:				
Scrap	177	128	14	United Kingdom 43; France 29.
Unwrought	1,778	891	33	U.S.S.R. 660; Japan 140.
Semimanufactures	1,280	1,027	65	Japan 700; United Kingdom 186.

See footnotes at end of table.

Table 3.—Federal Republic of Germany: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
METALS —Continued				
Tungsten:				
Ore and concentrate	2,855	3,841	3	China 2,042; Australia 340; Brazil 308.
Oxides and hydroxides	8	11	NA	U.S.S.R. 5.
Ash and residues containing tungsten	300	287	53	France 103; Sweden 32.
Metal including alloys:				
Scrap	380	422	30	United Kingdom 115; France 78; Netherlands 78.
Unwrought	394	444	5	Austria 302; France 66.
Semimanufactures	67	80	17	Austria 36; Belgium-Luxembourg 6.
Uranium and/or thorium:				
Ore and concentrate value, thousands	$5	$4	--	NA.
Oxides and other compounds	146	25	--	NA.
Metal including alloys, all forms:				
Uranium value, thousands	$111	$114	$114	
Thorium do	--	$5	--	United Kingdom $3.
Vanadium:				
Ore and concentrate	--	5	--	All from United Kingdom.
Oxides and hydroxides	2,360	1,455	208	Finland 902; China 306.
Ash and residue containing vanadium	29,878	27,826	1,367	China 5,104; Italy 1,982.
Zinc:				
Ore and concentrate	556,903	542,406	--	Canada 196,859; Greenland 63,962 Ireland 61,434.
Oxides	9,447	11,887	12	Netherlands 3,786; France 2,807.
Blue powder	12,678	11,302	NA	Belgium-Luxembourg 7,116; France 1,773.
Matte	5,765	9,712	219	Netherlands 2,596; United Kingdom 1,834.
Ash and residue containing zinc	93,312	60,582	3,404	Belgium-Luxembourg 15,206; United Kingdom 8,196.
Metal including alloys:				
Scrap	16,552	17,565	--	Netherlands 4,537; United Kingdom 2,831.
Unwrought	156,376	161,964	52	Belg. ..m-Luxembourg 60,925; Netherlands 33,019.
Semimanufactures	29,295	30,504	3	France 23,825; Netherlands 4,156.
Zirconium:				
Ore and concentrate	67,648	68,622	2,191	Australia 30,768; Republic of South Africa 26,683.
Metal including alloys:				
Scrap	4	11	NA	France 8.
Unwrought	13	16	10	France 3; Sweden 3.
Semimanufactures	386	339	127	France 197.
Other:				
Ores and concentrates	11,511	16,242	74	Chile 14,668; Peru 1,353.
Oxides and hydroxides	3,711	2,436	990	France 420; Belgium-Luxembourg 398.
Ashes and residues	236,377	207,920	696	Canada 117,754; East Germany 7,509.
Base metals including alloys, all forms	1,129	5,581	235	East Germany 5,010; Sweden 83.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc.	64,620	87,026	1,201	Greece 71,519; Iceland 8,268.
Artificial:				
Corundum	39,328	22,966	508	Austria 4,726; Yugoslavia 4,053.
Silicon carbide	66,540	59,475	21	Norway 12,330; U.S.S.R. 3,151; Italy 2,901.
Dust and powder of precious and semi-precious stones including diamond	219	178	176	Ireland 1.
Grinding and polishing wheels and stones	6,955	8,040	85	Austria 1,835; Italy 1,678; France 1,045.
Asbestos, crude	151,555	188,857	443	Canada 141,148; U.S.S.R. 18,606.
Barite and witherite	174,976	141,023	--	France 101,602; China 11,699; Spain 11,169.
Boron materials:				
Crude natural borates	105,759	109,401	56,864	Turkey 47,627.
Oxides and acids	17,418	18,505	7	France 8,237; Turkey 5,646.

See footnotes at end of table.

Table 3.—Federal Republic of Germany: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
NONMETALS —Continued				
Bromine	3,361	4,152	NA	Israel 3,160; United Kingdom 739.
Cement thousand tons	1,728	1,927	(2)	Belgium-Luxembourg 523; East Germany 492; France 427.
Chalk	120,428	180,102	1	France 150,976; Belgium-Luxembourg 17,730.
Clays, crude:				
Bentonite	70,476	82,442	16,538	Greece 45,792; Spain 7,386.
Ceramic	84,053	103,207	--	Netherlands 32,352; France 21,885; East Germany 19,416.
Chamotte earth	81,774	56,879	--	Czechoslovakia 36,095; France 13,421.
Fire clay	77,659	64,442	1,935	France 22,939; Czechoslovakia 21,497.
Fuller's earth	5,369	5,649	3,310	United Kingdom 1,115; Spain 869.
Kaolin	851,426	863,566	133,666	United Kingdom 379,486; Czechoslovakia 140,222.
Unspecified	124,745	155,619	11,736	Netherlands 57,103; Czechoslovakia 38,195.
Cryolite and chiolite	1,705	1,730	--	Greenland 1,706.
Diamond:				
Gem, not set or strung carats	493,004	534,446	8,990	Belgium-Luxembourg 243,905; India 76,177.
Industrial stones do	864,233	939,371	21,151	Belgium-Luxembourg 312,470; Republic of South Africa 265,090.
Diatomite and other infusorial earth	37,780	36,791	5,236	Denmark 21,782; France 6,282.
Feldspar, fluorspar, related materials:				
Feldspar	54,006	54,356	--	Norway 23,612; Italy 14,168.
Fluorspar	205,698	176,124	--	China 45,424; Republic of South Africa 38,570.
Unspecified	59,646	50,597	9	Norway 37,324; Netherlands 11,613.
Fertilizer materials:				
Crude, n.e.s	30,494	30,232	1,448	Netherlands 22,027.
Manufactured:				
Ammonia thousand tons	141	198	(2)	France 90; East Germany 58.
Nitrogenous do	3,135	2,447	3	Netherlands 876; Belgium-Luxembourg 539; East Germany 258.
Phosphatic do	860	796	--	Belgium-Luxembourg 585; France 113.
Potassic do	87	83	--	France 76.
Unspecified and mixed do	1,308	1,655	86	Belgium-Luxembourg 325; Netherlands 221; Austria 215.
Graphite, natural	32,433	28,869	24	China 6,700; Austria 3,293; Norway 2,237.
Gypsum and plaster	712,889	758,492	74	France 476,964; Austria 187,503.
Iodine	1,134	1,190	108	Japan 697; Chile 312.
Kyanite and related materials	82,053	72,289	51,244	Republic of South Africa 18,407.
Lime	262,057	285,015	--	France 181,526; Belgium-Luxembourg 48,388.
Magnesium compounds:				
Magnesite	230,732	262,239	--	Greece 49,169; Czechoslovakia 37,987; North Korea 33,094.
Oxides and hydroxides	3,577	4,923	900	France 1,812; Japan 659.
Other	89,525	99,085	31	Austria 21,830; North Korea 21,769; Greece 19,626.
Mica:				
Crude including splittings and waste	11,345	10,515	291	India 4,169; China 1,595.
Worked including agglomerated splittings	559	544	9	France 185; Belgium-Luxembourg 173.
Nitrates, crude	3,555	1,468	--	Chile 1,416.
Phosphates, crude thousand tons	1,931	2,031	939	Israel 167; undetermined 813.
Pigments, mineral:				
Natural, crude	453	164	NA	Cyprus 118.
Iron oxides and hydroxides, processed	10,085	15,867	6,539	Belgium-Luxembourg 3,117; Netherlands 2,586.
Potassium salts, crude	86,753	12,393	--	East Germany 12,370.
Precious and semiprecious stones other than diamond:				
Natural	838	900	27	Brazil 573; Republic of South Africa 94.
Synthetic	37	23	4	Switzerland 12; Bulgaria 3.

See footnotes at end of table.

Table 3.—Federal Republic of Germany: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
NONMETALS —Continued				
Pyrite, unroasted	71,472	80,190	--	Finland 33,356; Yugoslavia 16,762; Hungary 9,989.
Quartz crystal, piezoelectric kilograms	39	371	NA	Malaysia 285.
Salt and brine	801,054	749,323	31	Netherlands 500,093; East Germany 127,205.
Sodium compounds, n.e.s.:				
Carbonate, manufactured	181,748	168,851	59	Netherlands 66,671; East Germany 43,480.
Sulfate, manufactured	42,905	80,873	NA	Austria 30,537; Spain 14,179.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked thousand tons	906	875	(2)	East Germany 362; Sweden 93; Austria 84.
Worked do	653	732	(2)	Italy 437; Portugal 138.
Dolomite, chiefly refractory-grade do	545	457	(2)	Belgium-Luxembourg 401.
Gravel and crushed rock do	10,097	9,792	(2)	France 5,808; Denmark 1,412.
Limestone other than dimension do	1,116	1,291	--	Austria 604; France 299; Belgium-Luxembourg 271.
Quartz and quartzite do	87	63	1	Netherlands 22; Belgium-Luxembourg 12.
Sand other than metal-bearing do	r3,143	3,332	1	France 2,134; Netherlands 727.
Sand and gravel do	2,667	2,771	--	All from East Germany.
Sulfur:				
Elemental:				
Crude including native and byproduct	287,861	339,288	40,648	Canada 176,634; Poland 87,126.
Colloidal, precipitated, sublimed	635	783	1	France 552; Netherlands 136.
Dioxide	5,303	3,331	NA	Sweden 2,485.
Sulfuric acid	44,574	88,277	--	Netherlands 42,876; East Germany 15,506.
Talc, steatite, soapstone, pyrophyllite	121,699	141,788	585	Austria 58,330; France 32,303.
Vermiculite, perlite, chlorite	101,781	96,954	--	Greece 70,962; Hungary 11,609.
Other:				
Crude thousand tons	1,266	1,108	15	Norway 363; Austria 185; United Kingdom 131.
Slag and dross, not metal-bearing do	1,774	1,709	8	France 749; Belgium-Luxembourg 609.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	13,716	17,986	5,094	Trinidad and Tobago 11,971.
Carbon:				
Carbon black	5,259	3,564	22	Netherlands 2,261; United Kingdom 529.
Gas carbon	40,448	42,030	1,564	France 18,883; Netherlands 10,538.
Coal:				
Anthracite thousand tons	68	71	--	United Kingdom 61; U.S.S.R. 5.
Bituminous do	10,567	9,051	1,608	Republic of South Africa 2,360; Poland 2,040.
Lignite including briquets do	2,681	4,621	3	Czechoslovakia 2,641; East Germany 1,969.
Coke and semicoke do	910	684	65	France 254; Belgium-Luxembourg 103.
Gas, natural: Gaseous million cubic feet	1,835,438	1,844,581	NA	NA.
Peat including briquets and litter	37,093	46,244	--	U.S.S.R. 39,440; Poland 2,442.
Petroleum:				
Crude thousand 42-gallon barrels	536,436	481,347	--	United Kingdom 104,097; Libya 79,310; Nigeria 55,331.
Refinery products:				
Liquefied petroleum gas do	8,584	8,427	36	Netherlands 2,116; United Kingdom 1,272; East Germany 1,239.
Gasoline do	82,234	98,175	162	Netherlands 33,744; U.S.S.R. 20,973.
Mineral jelly and wax do	1,560	1,335	3	Netherlands 184; undetermined 672.

See footnotes at end of table.

Table 3.—Federal Republic of Germany: Imports of selected mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1982	1983	Sources, 1983	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued				
Petroleum —Continued				
Refinery products —Continued				
Kerosine and jet fuel thousand 42-gallon barrels	18,888	16,701	91	Netherlands 10,903; Belgium-Luxembourg 3,080.
Distillate fuel oil do	96,876	127,955	1,153	Netherlands 50,156; Belgium-Luxembourg 18,152.
Lubricants do	1,672	2,511	222	France 592; United Kingdom 354; Netherlands 353.
Nonlubricating oils do	55	NA		
Residual fuel oil do	45,938	60,006	83	Netherlands 19,050; U.S.S.R. 9,747.
Bitumen and other residues do	1,276	2,026	(2)	Netherlands 877; East Germany 583.
Bituminous mixtures do	110	132	4	Netherlands 75; France 17.
Petroleum coke do	6,331	5,930	5,050	Argentina 380; Netherlands 207.

[r] Revised. NA Not available.
[1] Table prepared by Jozef Plachy.
[2] Less than 1/2 unit.

COMMODITY REVIEW

METALS

Cobalt.—Approximately 500 tons of cobalt, as metal powder, oxide, and chemicals, was recovered by the sole producer, Hermann C. Starck Berlin, from scrap and residues, mostly imported. Starck remained a major world producer of metal powder, which comprised about two-thirds of its total production and was used in the manufacture of cemented carbides, magnetic alloys, nickel-base superalloys, and steel. The remainder of the recovered materials was cobalt oxide and salts for use in pigments, ceramics, frits, catalysts, and drying compounds. Total imports, including primary metals, were about 2,000 tons, mostly from Finland and Zaire. As a major world consumer of cobalt, the FRG used 1,500 tons of cobalt materials. Significant quantities were exported. A history of cobalt production and uses in Germany was published.[3]

Gallium.—According to Preussag AG Metall, a new plant for the extraction of gallium from gallium arsenide scrap, supplied by the domestic consuming industry, was in full operation at Langelsheim near Goslar. The plant could refine gallium to a very high purity, at least 99.99%, and increased the company's capacity for extracting gallium to 8 tons per year from the previous level of between 2 and 3 tons per year. The quantity of gallium arsenide scrap needed to produce 8 tons of pure gallium would equal about 30% of currently available world scrap stocks.

Vereinigte Aluminium-Werke AG also planned to double its high-purity electrolytic gallium production capacity to 5 tons per year at its Lunen plant. The expanded production was in response to increasing demands by the electronics industry for solid-state devices.

Iron and Steel.—After its general decline since 1979 to a low in 1982-83, the mostly privately owned steel industry began to show signs of recovery in 1984 as output increased significantly to 39 million tons of crude steel, 35 million tons of hot-rolled product, and 28 million tons of semimanufactures. This occurred despite a decrease in domestic demand during the first half of the year caused by a strike in the metalworking industries. Most of the demand increase occurred in the foreign market, particularly in the United States, as total steel exports increased by 16% to 18.4 million tons. Imports decreased slightly to 11.2 million tons. Despite the production increase, most of the steel industry did not begin to profit until the last quarter after unit steel prices were increased effective October 1 by about $10 per ton.[4]

Programs of modernization, company mergers and geographic centralization, plant closings, and layoffs continued to improve efficiency and profitability. Employment in the steel industry decreased by

5%, and productivity increased.

The lean and strengthened West German steel industry, believing that the continuing excessive subsidization of steel industries in other EEC countries was preventing fair competition, urged its Government to insist that EEC steel industries receiving large subsidies, especially those in Belgium, France, and Italy, be required to reduce capacity accordingly. In addition to competition from heavily subsidized EEC steel industries, the weakly subsidized West German industry faced inroads from developing countries. The EEC Government-subsidy program had begun in 1980 and was scheduled to cease at yearend 1985.

ARBED Saarstahl Group remained in financial difficulty and was still receiving heavy Government aid, as it had been for many years, much of it from the Saar regional government. The latter indicated that ARBED would require an additional $20 million in 1985 to avoid bankruptcy. This support, for reasons of regional rather than industrial policy, would require the approval of the EEC, which requested assurances that the company would return to viability within a reasonable time. The Saar government loaned ARBED about $40 million in 1984 but attached a condition that the company work closely with Dillinger Hüttenwerke AG, the other Saar producer, particularly in production of coke and pig iron, which was to be concentrated at Dillinger where construction of a new blast furnace began.

Total FRG pig iron and crude steel production capacity was decreased in compliance with EEC requirements. Steel industry capacity utilization rose to about 60% in 1984. Continuous casting continued to increase, accounting for about 80% of steel billet production, and this alone accounted for a significant part of the efficiency and productivity increases effected over the previous few years. Production of stainless steel increased 15% to about 880,000 tons. A planned significant increase in electrolytic galvanizing capacity, particularly by Thyssen Stahl AG, the FRG's largest steel producer and 1 of the world's 10 largest, was put on hold because of world overcapacity.

Lead and Zinc.—Traditionally, lead and zinc mining had been, and continued to be, the backbone of the FRG's mining industry. No new deposits had, however, been discovered in recent years, and the grade and metal content of the ores was decreasing. Preussag and Metallgesellschaft AG were virtually the only companies engaged in the lead-zinc industry.

In addition to the lead and zinc mines and smelters described in previous "Minerals Yearbooks," there were also the 145,000-ton-per-year electrolytic zinc smelter of Ruhr-Zink GmbH at Datteln (50% Metallgesellschaft and 50% Mount Isa Mines Ltd., Australia); the Imperial smelting furnace of "Berzelius" Metallhütten AG at Duisburg, with 80,000 tons of zinc and 30,000 tons of lead bullion capacity; the secondary lead smelter of Preussag at Harlingerode near Goslar, with a 70,000-ton capacity; and the electrolytic zinc plant of Weser-Zink GmbH at Nordenham, with a 120,000-ton capacity (75% Preussag and 25% Société Minière et Métallurgique de Penarroya, France), on the same site as the Preussag-Boliden-Blei GmbH smelter.

Preussag, headquartered in Hanover, operated its nonferrous metals division, principally lead and zinc, from Goslar. The total work force of the division was about 4,600 people, and sales in 1983 amounted to $415 million. Preussag accounted for about 45% of the FRG's lead production and 50% of its zinc production. The annual production of the Rammelsberg Mine in 1984 was about 280,000 tons of crude ore containing approximately 13% zinc, 5% lead, 1% copper, 3 ounces of silver per ton, and traces of gold. The flotation plant produced about 60,000 tons of zinc in concentrate, 20,000 tons of lead, 4,000 tons of copper, and 32,000 tons of barite. After the smelter at Goslar, Harz, was converted to the processing of secondary raw materials, the concentrates from the Rammelsberg Mine were sold to other smelters in Europe. Reserves were expected to be depleted in about 4 years, and the mine was to be shut down in 1988.

Annual production at Preussag's Bad Grund Mine in 1984 averaged about 420,000 tons of crude ore, containing approximately 6.5% zinc, 3.5% lead, and 2 ounces of silver per ton. The ore, treated at the mine, yielded 40,000 tons of zinc concentrate containing almost 62% zinc, and about 18,000 tons of lead concentrate containing 74% lead and 400 ounces of silver per ton. Reserves were estimated to be sufficient to last beyond the year 2000.

Preussag operated a lead-zinc smelter at Nordenham, at the mouth of the Weser River, in addition to the one at Goslar. Also, a plant at Langelsheim, near Goslar, produced high-purity antimony, arsenic, bis-

muth, cadmium, copper, gallium, germanium, gold, indium, lead, mercury, phosphorus, selenium, tellurium, thallium, tin, and zinc under the trade mark of PPM-Preussag Pure Metals.

Tantalum.—Tantalum mineral concentrates and tin slags had been the predominant feed materials for production of tantalum metal and compounds. A new electron-beam furnace was commissioned in 1984 by WC Heraeus GmbH, a major producer of tantalum mill products, thus increasing its ingot capacity tenfold, and the furnace broadened the company's raw materials base to include some materials not previously usable.

NONMETALS

The nonmetallic minerals industry in the FRG made slight advances in 1984. The potash industry, after decreasing in output since 1980, bounced back in 1983 and 1984 to the pre-1980 production level and became the most profitable nonmetallics industry. Most of the sales, by the only producer, Kali und Salz AG, were to domestic users. Western Europe accounted for about 19% of total world production of potash, nearly 50% of which was produced by Kali und Salz.[5]

Pumice.—After declining for several years, pumice production increased in 1984. Pumice from the FRG had an established foothold in the pumice market, particularly in the supply of raw pumice to neighboring countries.[6]

Pumice continued to be produced by a large number of small companies, about 122. More than 75% of these companies employed less than 20 people each. All production was concentrated in an area of about 30 square miles and was derived from one extinct volcano a few miles west of the small town of Neuwied, north of Coblenz. The pumice was mined in shallow pits with depths varying from 3 to 15 meters. Most of the better deposits, with almost no overburden, had been exhausted, and the industry was forced to rely on lean ores containing gross impurities, including silt. This led to the increased use of beneficiation methods, such as screening, washing, and heavy-medium separation.

Although the Neuwied area still contained about 35 to 45 million tons of pumice, the rapid depletion of higher purity reserves gave rise to research into the replacement of pumice by plentiful reserves of scoria in the same region. Initial tests indicated that this substitution in block manufacture was promising.

MINERAL FUELS

Total energy consumption, nearly one-half from domestic sources, increased 4% to 378 million tons of coal equivalent. Nuclear power, which increased 39% to about 30 million tons of coal equivalent, accounted for much of this increase, followed by small increases in gas and hard-coal consumption. Oil consumption, about 95% imported, was unchanged and accounted for about 42% of total energy consumption compared with 56% in 1979, an oil crisis year. The North Sea became the largest supplier of oil to the FRG, accounting for 28% of consumption. Coal and lignite, about 95% of which was produced domestically, continued to account for nearly one-third of energy consumption. Gas, approximately two-thirds imported, continued to account for about one-sixth of energy consumption. Gas consumption had decreased for several years and the increased consumption in 1984 was caused by industrial plants and households converting to gas. Gas imports from Denmark began in October. The Netherlands was the major supplier in 1983 followed by the U.S.S.R. and Norway.

More than 60% of the baseload electrical power in 1984 was generated with coal. Nearly 30% was produced by 17 nuclear power stations; 11 more nuclear plants were under construction, and another 9 were planned.

Veba AG was FRG's biggest energy and chemicals firm, and Ruhrkohle AG was the country's dominant coal producer.

Coal.—Coal remained the FRG's only abundant indigenous source of energy. During the previous few years, however, it had been severely affected by the sharp drop in demand from the steel industry, which had been the largest user of coal. In 1984, the utilities became the largest purchaser of Ruhrkohle coal. Ruhrkohle produced almost 75% of the FRG's coal, 58 million tons in 1983 and about 52 million tons in 1984.

Hard-coal production in the FRG continued to decline, by about 3 million tons to a total of 79 million tons in 1984; this was produced in four mining districts, of which the Ruhr area was by far the most important, producing about 80% of the total. All areas practiced longwall mining, and both shearing (rotating drum) methods and plowing methods were used.

Ownership of Ruhrkohle was radically altered during the year when the owner

steel companies sold most of the firm to the two largest FRG energy producers. As a result, Veba increased its holdings from 27.2% to just under 40%, while Vereinigte Elektrizitaetswerke Westfalen AG increased its share to 21.9%. The remaining shareholders were Thyssen AG, 12.7%; Hoesch AG, 7.6%; and the French company Société Nouvelle Sidechar, 8.3%.

Ruhrkohle continued to operate at a loss. The Government lowered its subsidy on coking coal at yearend 1984 from $20 to $16 per ton. Although the steel industry increased output significantly and used only domestic coking coal, Ruhrkohle was nevertheless in the process of reducing its coal production capacity from 57.9 million tons in 1984 to 55 million tons in 1987.

Ruhrkohle, as reserves in its present areas became exhausted, had started to mine in newer areas north and northwest of the Ruhr Basin.[7] Since this is the area of the scenic Lippe Valley, access to the new areas was limited to ventilation and personnel shafts, and the coal is being moved southwards by high-speed underground rail systems to the existing shafts in the Ruhr, which were near powerplants and coking plants and had a supply of skilled labor as well.

Extraordinary precautions had been taken to protect the environment in surface lignite mining in the densely populated Cologne Aachen area.[8] Entire villages, roads, rivers, and factories were relocated. The overburden was being carefully removed and stored to be replaced after completion of mining.

Natural Gas.—Domestic sources supplied 32% of the country's needs in 1983. Most of this production, 57%, came from the Weser-Ems River estuaries in the northwest, 15% from the Hanover region, and the remainder from the upper Rhine Valley and the Alpine foothills. Shipments of natural gas from the Soviet Union accounted for almost 25% of total requirements in 1983 and were growing. On October 1, 1984, the Soviet Union began delivery of Siberian natural gas to the FRG via the new trans-Siberian gas export line, construction of which had begun in November 1981. The pipeline started in the Urengoi Gasfield of Western Siberia and terminated at the Czechoslovak border. The gas was then transmitted to Western Europe via the existing pipelines. By 1990, the Soviet pipeline was expected to deliver to the FRG some 30% of its natural gas requirements. At a September meeting in Munich, the Energy Fuels Committee of the West German-Soviet Economic Commission resolved to promote closer cooperation between the two countries in the energy field, notably in extracting Siberian coal reserves and in the utilization of solar as well as wind energy. Other foreign suppliers of natural gas to the FRG were the Netherlands (43%), Norway, and, as of the first week of October 1984, Denmark, in decreasing order.

Domestic consumption of natural gas rose. The use of natural gas in powerplants continued to decline.

Petroleum.—Petroleum remained the main energy source in the FRG, but its share had fallen by 25% between 1979 and 1984, contributing only 41% of the total in the latter year. The refining industry continued to suffer from changing markets, foreign competition, declining consumption and high crude prices, which were in high-valued dollars.[9] The dollar rose sharply again in 1984, and the industry was hit with a 10% increase in crude oil costs, as imports increased by only 2.3%. Oil refining had been profitable in the FRG in only 1 year between 1974 and 1984. In 1984, 14 refineries continued to operate in competition with more than 100 refinery product importers.

A general decline in crude oil prices had continued after the price rise in 1973, and especially the second round of increases in 1980. This had caused a concurrent decrease in prices of refinery products, notably light and heavy fuel oils that were amenable to substitution by other energy sources such as coal. At the same time, a large increase, about 27%, occurred in consumption of gasoline. The oil companies, however, found it uneconomic to continue converting heavy products to the lighter ones because of the price squeeze, and a large number of conversion facilities, led by those operated by British Petroleum Co., were in the process of closing down.

The FRG's small domestic petroleum production came from onshore wells in northwest areas of the country. In 1984, it was announced that a second offshore well would be developed by Deutsche Texaco AG and Wintershall AG. The well was to be a pilot operation, starting in 1986, to test feasibility of commercial production. An artificial island, Mittelplate, was to be constructed in the North Sea about 5 miles offshore from Schleswig Holstein, from which ultimately five wells would be drilled. The pilot production was to be barged to Brunsbuttel and moved by pipeline to Texaco's refinery at Heide.

[1]Physical scientist, Division of International Minerals.
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[5]Phosphorus & Potassium (London). World Potash Markets. No. 135, Jan.-Feb. 1985, pp. 20-21.
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